

# **CDF Operations Report**

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**All Experimenter's Meeting**  
**November 14, 2005**

# CDF Store Summary (7–14 November, 2005)

Store	Start Date	Time [hrs]	Uptime [hrs]	Ini.lumin [E30]	Tot. Del. Lumin. [pb <sup>-1</sup> ]	Live Lumin. [pb <sup>-1</sup> ]	Comments
4490 Abort	11/06 Sun-Mon	17.7	15.9	159.1	4.2	3.2 76%	High beam losses
4492 Normal	11/08 Tue-Wed	27.3	25.0	128.5	4.1	3.5 85%	Data logger, IMU, High beam losses
4494 Normal	11/09 Wed-Thu	24.3	20.9	120.9	3.9	3.1 80%	Data logger, L2 trigger
<b>4495</b> Normal	<b>11/10</b> Thu-Sat	<b>36</b>	<b>35.4</b>	<b>179.4</b>	<b>7.1</b>	<b>6.4</b> 91%	<b>Best store</b>
4497 Normal	11/12 Sat-Sun	28.8	27.9	159.9	5.5	4.4 80%	L2 trigger
<b>Total</b>	11/07- 11/14	<b>134.1</b>	<b>125.1</b> 93.3%		<b>24.8</b>	<b>20.6</b> 83%	

*Many record and among them record for integrated luminosity in a single run: 4.4 pb<sup>-1</sup>*

# System News

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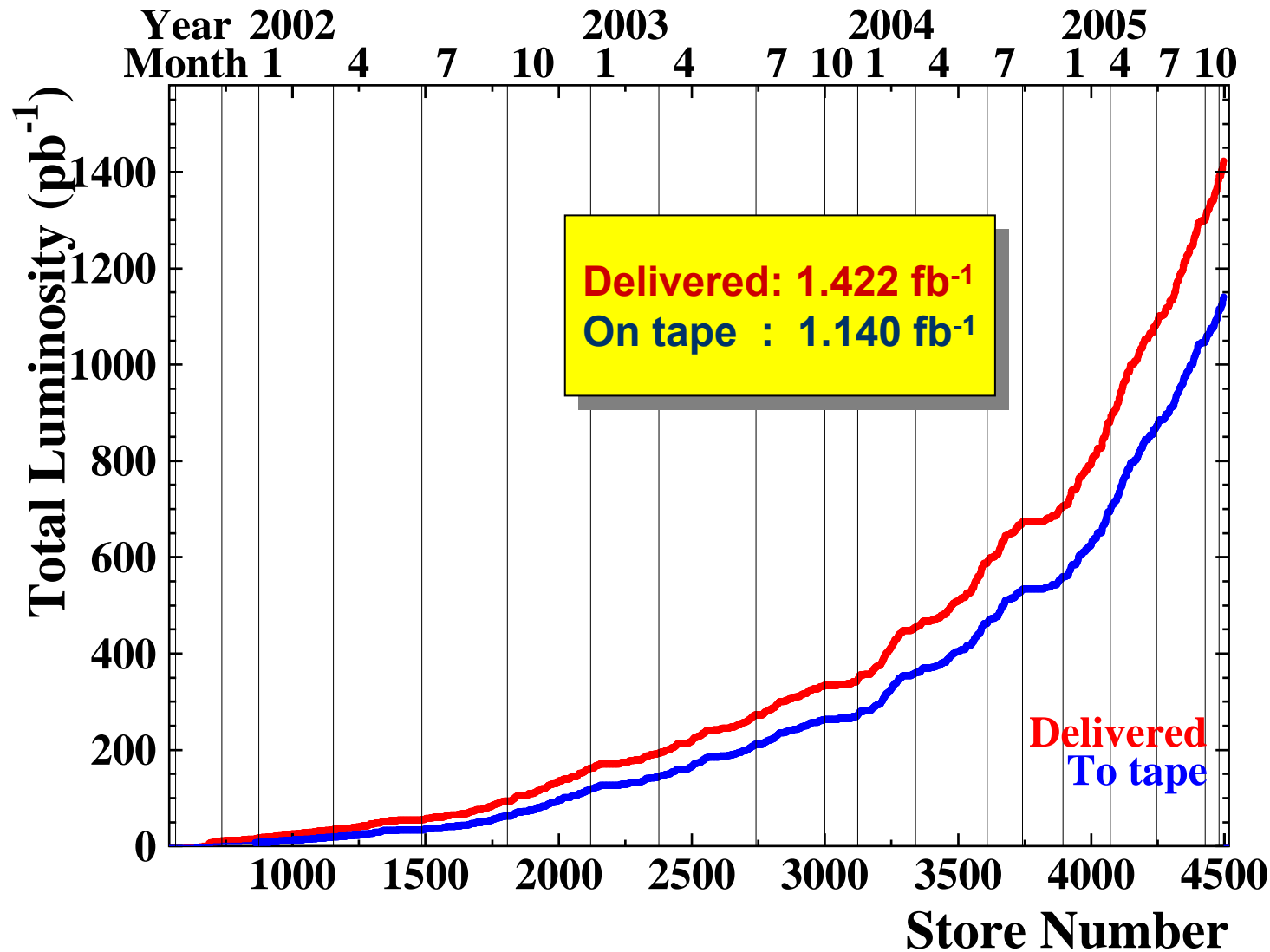
- Run IIb Stereo track trigger upgrade
  - Successful tests with board prototypes
  - Test of real modules expected soon
- Trigger
  - New trigger tables tested for study of the diffractive physics during the low luminosity runs in December
- Silicon
  - Smooth running
- Online Computing
  - Upgrade to Linux 3.0.5 on online machines in progress

# Access Report

Wednesday, November 9

- COT TDC upgrade
  - 16 out of 20 crates with TDCs are complete
- Muon Detector
  - Chambers having HV problem were isolated in the Intermediate Muon Upgrade (IMU) system
  - HV cables re-segmented in one of the IMU sectors
- Radiation Monitoring
  - Active dosimeters replaced to increase sensitivity

# Run II Integrated Luminosity



# CDF Data Analysis

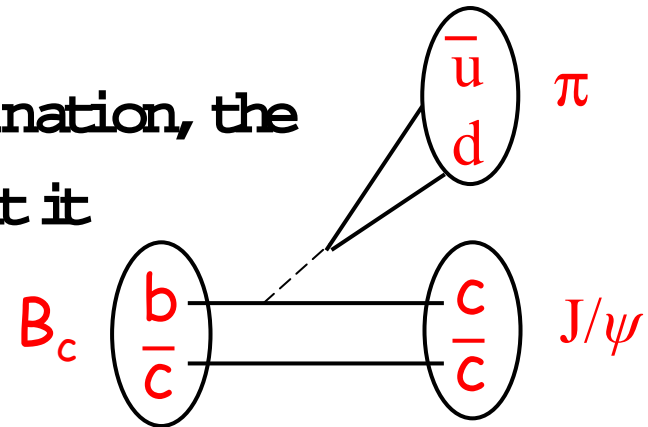
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- All the data taken through September 4<sup>th</sup> has processed with the final calibrations by October 21<sup>st</sup>
- Many analysis groups already have prepared *ntuples*
- The first physics result from these data sample  
“Observation of the exclusive  $B_c \rightarrow J/\psi + \pi$  decay” was approved on November 10<sup>th</sup> : Only 2 months from the data taking to the final results approved

# Observation of the exclusive $B_c \rightarrow J/\psi + \pi$ decay

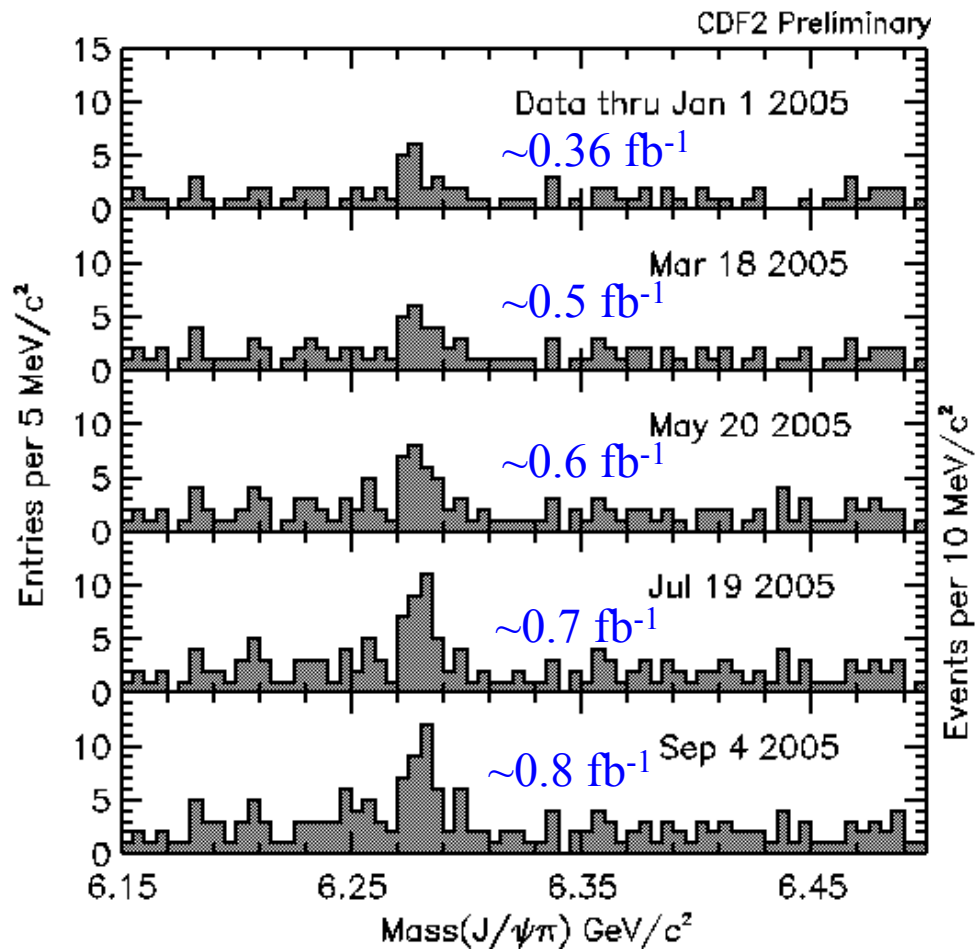
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- Ground state of a  $cb$  quark combination, the last meson, very little known about it

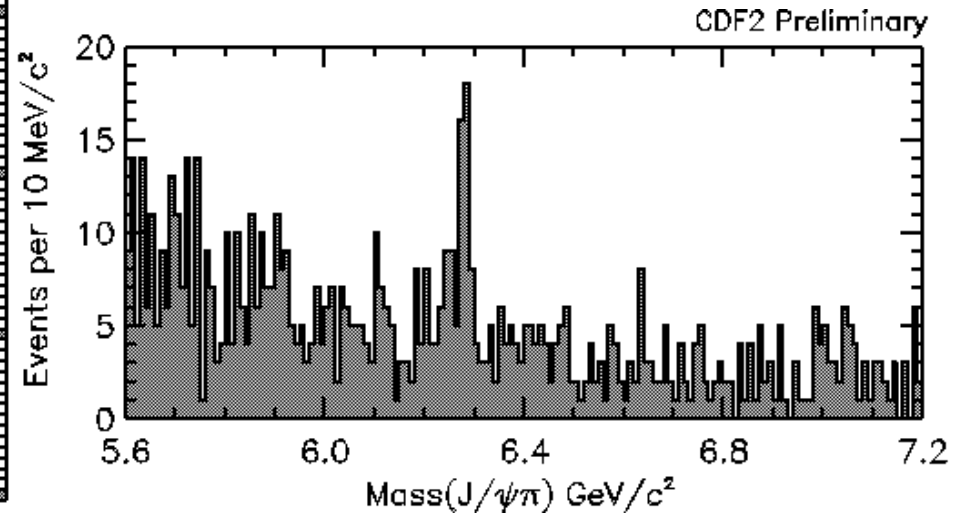


- Theoretical prediction is more precise than the experimental mass measurement
- Reference decay mode  $B \rightarrow J/\psi + K$
- Full reconstruction allows for precise mass measurement

# Observation of the exclusive $B_c \rightarrow J/\psi + \pi$ decay



38.9 Signal and 26.1 bg events  
between 6.24 - 6.3 GeV/c<sup>2</sup>  
Significance  $> 6\sigma$  over search  
area



**Best in world!**

$$\text{Mass}(B_c) = 6275.2 \pm 4.3 \pm 2.3 \text{ MeV}/c^2$$